

REMARKS

Claims 1 is amended to correct a typographical error. Claim 15 is amended to insert the term "wavelength swept," which appears throughout the application as originally filed. Claims 1-6, 9-12, and 15-18 remain in the case for consideration. Applicants request reconsideration and allowance of the claims in light of the above amendments and following remarks.

Applicants' Summary of Substance of Interview

On January 20, 2004, a telephonic interview occurred between Examiner Armando Rodriguez, Examiner Paul Ip, and applicants' attorney Todd Iverson. The applicant's attorney was prepared to discuss the rejections of claims 1 and 15 as outlined in the final Office Action mailed on 10/15/2003, and in particular, the rejection of claims 1 and 15 under 35 USC §102 based on USPN 5,812,567 to Jeon et al. (hereafter, "Jeon").

Applicants' attorney outlined the reasons why Jeon fails to anticipate claims 1 and 15, which are reproduced below in the remainder of this paper.

Rather than discussing the §102 rejections, however, the Examiners responded by indicating that claims 1 and 15 were unclear and thus not allowable. Applicants' attorney pointed out that in the Final Office Action mailed on 10/15/2003 there were no 35 USC §112 rejections. In fact, upon further examination it appears that Examiner Rodriguez explicitly stated that the 35 USC §112 rejections were withdrawn based upon the applicants' previous arguments and amendments.

Nevertheless, the Examiners indicated that because FIGS. 1a and 1b of the application as filed illustrate an optical path 150 with three elements (gain medium 120, non-linear medium 140, and wavelength tunable filter 130) that appear in a certain order, claims 1 and 15 must recite that the three elements appear in that order. The Examiners indicated that amending claims 1 and 15 in this manner might result in allowance of claims 1 and 15.

The applicants' attorney agreed to submit a proposed draft amendment for the Examiners' consideration. The telephonic interview was then concluded.

Claim Rejections – 35 USC § 112

Upon further consideration of the Examiners' suggestions made during the telephone interview, the applicants' believe that the continued rejection of claims 1 and 15 based on 35 USC § 112 is improper.

It is alleged that claim 1 is unclear because the recited optical path includes three elements that are not recited in the same order in which they appear in FIGS. 1a and FIGS. 1b. The applicants' strongly disagree.

There is no rule that requires applicants to recite a claim so that it conforms exactly to the structure disclosed in a single embodiment of the invention (such as the embodiments shown in FIG. 1a and 1b). Claim 1 recites that the optical path includes three elements. Those elements are clearly illustrated in FIGS. 1a and 1b, and they are also described in the written specification. The clearness requirements of 35 USC §112 are fulfilled. No additional specificity in claim 1 is required.

Furthermore, claim 1 recites a laser comprising, *inter alia*, a resonator having an optical path. It is well known to those of ordinary skill in the art that in a laser resonator selected modes of light oscillate back and forth along the optical path within the resonator. In other words, during one round trip along the optical path the light in the resonator will encounter every element. Thus, the order in which elements inside the resonator are specifically positioned have absolutely no bearing on whether lasing will occur. If necessary, the applicants are prepared to submit a declaration under 37 CFR §1.132 stating that such is the case.

It is also alleged that the following element of Claim 15 is unclear: "preparing within a resonator a wavelength tunable filter and a non-linear medium with light intensity dependent refractive index." The element is allegedly unclear because the resonators shown in FIGS. 1a and 1b have at least three elements (a gain medium 120, a non-linear medium 140, and a tunable filter 130) on the optical path 15. The applicants strongly disagree.

Not only is there no requirement that claim features must have exactly the same order as shown in a single embodiment of the invention (e.g., FIGS. 1a and 1b), there is no requirement that a claim must recite all the features shown in that embodiment either. Thus, if the applicants wish to omit from the process of preparing within the laser resonator a gain medium (a feature that is entirely conventional), the applicants may do so. Such an omission does not render the claim unclear.

Claim Rejections - 35 USC § 102

Claims 1, 2, 4-6, 9-12, and 15-18 are rejected under the pre-American Inventors Protection Act of 1999 (AIPA) version of 35 USC 102(e) as being anticipated by Jeon. The applicants respectfully disagree.

Claim 1 recites "a filter modulation signal generating means for continuously varying the minimum loss center wavelength range of said wavelength tunable filter with time."

It is apparently alleged that the Faraday rotator disclosed by Jeon (FIG. 3 element 52) is the claimed filter modulation signal generating means. To the contrary, Jeon teaches (and the Examiner has also stated in the final Office Action mailed 10/15/2003) that the Faraday

rotator 52 is for controlling the direction of polarization of the beam (FIG. 3; column 2, lines 47-49). Thus, Jeon's Faraday rotator 52 is not the recited filter modulation signal generating means because it does not continuously vary the minimum loss center wavelength range of the wavelength tunable filter with time.

Consequently, Jeon does not anticipate claim 1 because it fails to teach the claimed invention in as complete detail as disclosed by the claim (see MPEP 2131). Claims 2-6 and 9-12 inherently contain the features of claim 1. Consequently, Jeon also fails to anticipate claims 2-6 and 9-12 at least because it does not teach all the features inherent to the claims (see MPEP 2131).

Claim 15 is amended to recite a method of mode-locked *wavelength-swept* laser pulse generation (emphasis added). This amendment is fully supported by the original application at, e.g., the title of the application. Claim 15 also recites continuously varying the minimum loss center wavelength range of the wavelength tunable filter.

The Examiner alleges that the following teaching of Jeon discloses the above features of claim 15: "The acousto-optic tunable filter 111 not only shifts the wavelength of propagating light in the laser cavity to be *continuously varied* but also passes only the light with the defined spectrum bandwidth (column 3, lines 25-29; emphasis added).

Strictly speaking, the above portion of Jeon only describes what effect the acousto-optic filter 111 has on the wavelength of propagating light within the laser cavity, it *does not* state that the minimum loss center wavelength range of the wavelength tunable filter continuously varies (emphasis added).

Furthermore, it will be shown below that there are two interpretations of the words "continuously varied" and also that the Examiners interpretation is inconsistent with the very nature of Jeon's invention.

The heart of this inconsistency lies within the fact that a "wavelength-tunable" laser has a fundamentally different output than a "wavelength swept" laser. The applicants define a wavelength-swept laser as one whose output wavelength continuously varies with time (see page 1, lines 13-14). The applicants teach wavelength-swept lasers are distinct from wavelength-tunable lasers (see page 1, lines 21-22). The applicants teach that in some applications, wavelength-swept lasers are expected to take the place of conventional wavelength tunable lasers (see page 1, lines 27-28).

Those of ordinary skill in the art know that a wavelength tunable laser is one in which the laser output is "tuned" to a consistent and stable output wavelength, meaning an output that *does not vary with time* (emphasis added).

Jeon consistently teaches that his invention is of the "wavelength-tunable" laser variety. See, e.g., Jeon's title ("Wavelength Tunable Mode-Locking Optical Fiber Laser"); column 1, lines 60-62 ("tunable over a broad range"); column 3, lines 20-21 ("laser pulse is wavelength tunable"); column 4, lines 30-32 ("wavelength tunable characteristics ... is achieved by changing the wavelength applied to the acousto-optic tunable filter"); and column 4, line 35 ("a very stable pulse [is achieved]").

Consequently, to allege that Jeon teaches continuously varying the minimum loss center wavelength range of the wavelength tunable filter is fundamentally incompatible with Jeon's stated purpose of achieving a wavelength tunable laser output with a stable pulse.

The applicants believe that when Jeon uses the term "continuously varied", he is actually referring to the dual function of the acousto-optic filter 111 that consists of shifting the wavelength of the input light and passing only light with a defined linewidth (see especially column 3, lines 11-13). "Continuously varied" is used to explain that the continuous wave with low power is continuously shifted and filtered after every complete round trip inside the laser cavity (column 3, lines 29-32). Thus, from this point of view, it is easily seen that "continuously varied" means the continuous shifting/filtering function applied to the light in the resonator by the acousto-optic filter 111.

In summary, nowhere does Jeon teach that the minimum loss center wavelength range of the wavelength tunable filter is continuously varying. Furthermore, Jeon does not teach a wavelength swept laser as recited in amended claim 15.

Consequently, Jeon does not anticipate claim 15 because it fails to teach the claimed invention in as complete detail as disclosed by the claim (see MPEP 2131). Claims 16-18 inherently contain the features of claim 15. Consequently, Jeon also fails to anticipate claims 16-18 at least because it does not teach all the features inherent to the claims (see MPEP 2131).

Claim Rejections – 35 USC § 103

Claim 3 is rejected under 35 USC 103(a) as being unpatentable over Jeon in view of USPN 5,469,454 to Delfyett, Jr. (hereafter, "Delfyett"). The applicants respectfully disagree.

Claim 3 inherently contains the features of claim 1. Claim 1 is not alleged to be non-obvious under 35 USC §103. If an independent claim is nonobvious under 35 USC § 103, then any claim depending therefrom is nonobvious (MPEP 2143.03).

Conclusion

For the foregoing reasons, reconsideration and allowance of claims 1-6, 9-12, and 15-18 of the application as amended is solicited. The Examiner is encouraged to telephone the

undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.



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